DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

Bay Area Branch
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Contract #: 04-0120F4
Cty: SF/Ala Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-014494
Date Inspected: 29-May-2010

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 1900
OSM Departure Time: 700
Location: Shanghai, China

CWI Name:	See below	**CWI Present:**	☑ Yes ☐ No
Inspected CWI report:	☐ Yes ☑ No ☐ N/A	**Rod Oven in Use:**	☑ Yes ☐ No ☐ N/A
Electrode to specification:	☑ Yes ☐ No ☐ N/A	**Weld Procedures Followed:**	☑ Yes ☐ No ☐ N/A
Qualified Welders:	☑ Yes ☐ No ☐ N/A	**Verified Joint Fit-up:**	☑ Yes ☐ No ☐ N/A
Approved Drawings:	☑ Yes ☐ No ☐ N/A	**Approved WPS:**	☑ Yes ☐ No ☐ N/A
		Delayed / Cancelled:	☐ Yes ☑ No ☐ N/A

Bridge No: 34-0006
Component: Tower and OBG Components

Summary of Items Observed:

On this date Caltrans OSM Quality Assurance Inspector (QA Inspector) George Goulet was present during the times noted above for observations relative to the work being performed.

Bay 10
This QA Inspector randomly observed the following work in progress in Bay 10:

FCAW welding of weld joint ED1-A20A/B-36 located on PCMK east tower, base shear plate assembly, single connection plate to stiffener. Welder was identified as 042218. QC was identified as ZPMC CWI Li Lin (QC1). Welding variables recorded by QC1 appeared to comply with WPS-B-T-2331-TC-P4-F.

FCAW welding of weld joint ED1-A20A/B-37 located on PCMK east tower, base shear plate assembly, single connection plate to stiffener. Welder was identified as 040609. QC was identified as QC1. Welding variables recorded by QC1 appeared to comply with WPS-B-T-2331-TC-P4-F.

FCAW welding of weld joint ED1-A29A/B-61 located on PCMK east tower, base shear plate assembly, single connection plate to stiffener. Welder was identified as 049220. QC was identified as QC1. Welding variables recorded by QC1 appeared to comply with WPS-B-T-2331-TC-P4-F.

FCAW welding of weld joint ED1-A29A/B-62 located on PCMK east tower, base shear plate assembly, single connection plate to stiffener. Welder was identified as 040736. QC was identified as QC1. Welding variables recorded by QC1 appeared to comply with WPS-B-T-2331-TC-P4-F.

FCAW welding of weld joint ED1-A29A/B-73 located on PCMK east tower, base shear plate assembly, single connection plate to stiffener. Welder was identified as 040704. QC was identified as QC1. Welding variables recorded by QC1 appeared to comply with WPS-B-T-2331-TC-P4-F.

Bay 11
This QA Inspector randomly observed no welding related work being performed in Bay 11.

OBG Trail Assembly Area
SMAW welding of weld joint SEG050B-018 located inside PCMK OBG 9AE, east side of floor beam at panel point 73 to north longitudinal diaphragm. Welder was identified as 054467. QC was identified as ZPMC CWI Li Yang (QC2). Assisting QC2 at this location and appearing to be monitoring the welding and recording data was ZPMC QC Wang Li Yang, who was not a CWI. Welding variables recorded by QC2's assistant appeared to comply with WPS-345-SMAW-3G(3F)-repair.

Heavy Dock
ABF Representative Zhao Ying Sheng informed this QA Inspector that no work was being performed on the heavy dock.

Bay 9 – PMT
This QA Inspector monitored OBG Production Monitoring Test (PMT) #3081 for deck panels DP3081-001 and DP3078-001 at Gantry #1. Prior to the start of the PMT, this QA Inspector observed the root openings to be within the 0.0 to 0.5mm tolerance. The magnetic particle test (MT) of the tack welds was noted on the test panel as having been performed by ZPMC MT Technician Wang Wei on 5/29/10. The visual inspection of tack welds and root gaps was performed by ABF Representative Wang Wan Cheng (ABF), ZPMC CWI Guo Yanfei (PQC), and this QA Inspector. The tack welds and root gaps appeared to be within prescribed tolerances. This QA Inspector observed that the deck plate of the test panel was 20mm thick and the deck plate of the production panels were 20mm thick. The ambient temperature was approximately 18°C. Flame preheat was applied to the specimens to above 60°C immediately prior to start of the gas metal arc welding (GMAW) pass. The interpass temperature was checked between processes and observed to be above 60°C. The start time for welding of the 2–12mm x 20mm specimens was approximately 0010 hours on 5/30/10 and the finish time was approximately 0034 hours. This QA Inspector randomly verified and documented the welding amperage, voltage, and travel speed during the gas metal arc welding (GMAW) and submerged arc welding (SAW) processes, and performed a visual inspection welds 1 thru 4 at the completion of both the GMAW root pass and SAW cover pass. The welding variables recorded by PQC appeared to comply with WPS-B-T-2342-U1-(U-rib)-5. The welds were visually inspected by ABF, PQC and this QA Inspector. PQC and ABF informed this QA Inspector that weld #3 appeared to burn throught the back side of the root pass resulting in what appeared to be major porosity and incomplete fusion, not in conformance with contract documents and were not acceptable. See photo below. PQC rejected the test and this QA Inspector concurred.

This QA Inspector monitored the second attempt of OBG Production Monitoring Test (PMT) #3081 for deck panels DP3081-001 and DP3078-001 at Gantry #1. Prior to the start of the PMT, this QA Inspector observed the root openings to be within the 0.0 to 0.5mm tolerance. The magnetic particle test (MT) of the tack welds was noted on the test panel as having been performed by ZPMC MT Technician Wang Wei on 5/28/10. The visual

inspection of tack welds and root gaps was performed by ABF Representative Wang Wan Cheng (ABF), ZPMC CWI Guo Yanfei (PQC), and this QA Inspector. The tack welds and root gaps appeared to be within prescribed tolerances. This QA Inspector observed that the deck plate of the test panel was 20mm thick and the deck plate of the production panels were 20mm thick. The ambient temperature was approximately 18°C. Flame preheat was applied to the specimens to above 60°C immediately prior to start of the gas metal arc welding (GMAW) pass. The interpass temperature was checked between processes and observed to be above 60°C. The start time for welding of the 2–12mm x 20mm specimens was approximately 0052 hours on 5/30/10 and the finish time was approximately 0112 hours. This QA Inspector randomly verified and documented the welding amperage, voltage, and travel speed during the gas metal arc welding (GMAW) and submerged arc welding (SAW) processes, and performed a visual inspection welds 1 thru 4 at the completion of both the GMAW root pass and SAW cover pass. The welding variables recorded by PQC appeared to comply with WPS-B-T-2342-U1-(U-rib)-5. The welds were visually inspected by ABF, PQC and this QA Inspector. PQC and ABF informed this QA Inspector that all four welds were acceptable and this QA Inspector concurred. This QA inspector randomly witnessed ZPMC ultrasonic testing (UT) technician, identified as Tang Xingshan, perform UT on each of the 500 mm test welds for depth of penetration and conformance. This QA Inspector selected ten designated locations for macroetch sampling per contract requirements. Each macroetch sample location was stamped by ZPMC personnel with the number 3081, a letter G stamped laying on its side, chosen randomly by this QA Inspector as a verification mark, and an individual progressive macroetch identifying number for each macroetch sample. After removal from each of the weld test specimens, polishing, and acid etching of the selected end, the macroetch samples were evaluated with a 7X optical magnifier and accepted by PQC, ABF, and this QA Inspector.

All ten sample macroetch samples appeared to meet requirements and were noted to appear acceptable. See Caltrans U-ribs PMT Inspection Sheet, ZPMC production monitoring test plate inspection report, and Caltrans Macro Etch Log - all dated 5/30/2010 for additional information.

Unless otherwise noted, all work observed on this date appeared to generally comply with applicable contract documents.

Summary of Conversations:
As noted above.

WELDING INSPECTION REPORT

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Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Skyler Guest, 150-0042-2360, who represents the Office of Structural Materials for your project.

Inspected By:	Goulet,George	Quality Assurance Inspector
Reviewed By:	Dawson,Paul	QA Reviewer